[0021] b. incubating the labeled peptide or labeled at least one of the antibody/antigen attachment sites of step b with the serum obtained from the subject who has cancer, and allowing time for specific binding between the labeled peptides and B cells.

[0022] In some embodiments of the method of detecting B cells which generate antibodies against the cancer cells, the type of label of the peptide of step a is selected from a group comprising radioactive isotopes, radiolabeled amino acid, and/or fluorescent amino acids. In some embodiments, the labeled B cells are isolated, cell cultured, and induced to produce the cancer-specific antibodies. In some embodiments, a method of treating a subject who has cancer is disclosed, the method comprising administering to said subject a therapeutically effective amount of the isolated B cells. In some embodiments, a method of treating a subject who has cancer is disclosed, the method comprising administering to the said subject who has cancer a therapeutically effective amount of the antibodies, and/or their derivatives, produced by the isolated B cells.

DETAILED DESCRIPTION

[0023] The presently disclosed subject matter now will be described more fully hereinafter. The presently disclosed subject matter may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Indeed, many modifications and other embodiments of the presently disclosed subject matter set forth herein will come to mind to one skilled in the art to which the presently disclosed subject matter pertains having the benefit of the teachings presented in the foregoing descriptions. Therefore, it is to be understood that the presently disclosed subject matter is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims.

[0024] The present disclosure provides a method for utilizing a checkpoint inhibition in a subject who has cancer for generation, isolation, and identification of cancer-specific antibodies. The subject who has cancer may be, for example, a cancer patient. In some embodiments, the checkpoint inhibition is, or is part of, a treatment administered, for example, by a physician, to a cancer patient. In some other embodiments, the checkpoint inhibition is performed exclusively, or mainly, for the purpose of inducing the generation of cancer-specific antibodies in a cancer patient, and isolating the antibodies generated.

[0025] Treatment of cancer with immune checkpoint inhibitors may be less toxic and easier to tolerate than most chemotherapy drugs, and some immune checkpoint inhibitors are already in use with a wide range of cancer types. For example, a PD-1 inhibitor, Nivolumab, has been approved to treat melanoma, lung cancer, kidney cancer, bladder cancer, head and neck cancer, and Hodgkin's lymphoma. Another drug, ipilimumab-a CTLA-4 inhibitor, was approved for treatment of melanoma. Some of other types of cancers are also treated with immune checkpoint inhibitors, including breast cancer, cervical cancer, colon cancer, and liver cancer. However, even immune checkpoint inhibitors may cause side effects, especially when administered as a long term, and/or continuous, treatment. The presently disclosed disclosure provides a method of utilizing a treatment, or an acute treatment, with immune checkpoint inhibitor/s for isolating and characterizing cancer-specific antibodies generated in a cancer patient as a result of the checkpoint inhibition. The cancer-specific antibodies isolated and characterized, and/or their antigens' binding sites, may be used for creating cancer-specific medication/s aimed at killing, or inactivating, cancer cells while causing minimal harm to normal cells.

[0026] In some embodiments, the present disclosure provides a method for identifying cancer-specific antibodies utilizing an immune checkpoint inhibition treatment in a cancer patient. Generally, the presently disclosed method comprises the steps of:

a. Obtaining cancer cells and/or their components, and normal cells and/or their components from a cancer patient. Obtaining cells and or/their components from the cancer patient can be done using any suitable method known in the art, such as without limitation, biopsy. The cells and/or their components are then kept for future use. Keeping the cells and/or their components for future use may be done using methods traditional in the art, such as freezing them in a cell culture medium (such as a buffer). In some embodiments, prior to freezing the cells they are proliferated in cell culture dishes. In some other embodiments, the cells are kept for future use in cell culture dishes by continues proliferation and splitting using methods traditional in the art.

In a preferred embodiment, the cancer cells and/or their components are of the same tissue type as the normal cells and/or their components. In other embodiments, the cancer cells and/or their components are of a tissue type similar, or related, to the tissue type of the normal cells and/or their components. In yet other embodiments, the cancer cells and/or their components are of a tissue type distinct from the tissue type of the normal cells and/or their components.

b. Administering the immune checkpoint inhibition treatment to the cancer patient. In some embodiments, prescription of the immune checkpoint inhibition treatment and administration thereof is performed by the cancer patient physician/s. Immune checkpoint inhibitors are usually administered intravenously. The treatment period usually lasts 30 to 60 minutes. The number of sessions may vary depending on the immune checkpoint inhibitor/s drug being administered. In some cases, a longer-term treatment may bring about more toxic side effects then a shorter, acute, treatment. In some embodiments, the presently disclosed method results in the creation of cancer-patient-specific, and cancer-specific, medication/s which may be administered to the cancer patient whether the immune checkpoint inhibition treatment is chronic or acute. In some other preferred embodiments, the presently disclosed method provides cancer-patient-specific, and cancer-specific, medication/s which may be administered to the cancer patient, wherein the immune checkpoint inhibition treatment is acute, i.e. when the cancer patient receives the presently disclosed cancer-patient-specific, and cancer-specific, medications he/she no longer receives the immune checkpoint inhibition treatment. Thereby limiting toxicity from a long exposure to the immune checkpoint inhibition treatment to the minimum. In any of the embodiments of the present disclosure the "cancer patient" may be the cancer patient from whom the cancer cells and/or their components, and normal cells and/or their components were obtained, or any other cancer patient, or any subject in need.